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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/680,067	07/15/1996	WAYNE J. SCHMIDT		6114

7590 05/05/2005

PERKINS COLE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER

LEADER, WILLIAM T

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

15

Office Action Summary

Application No.

08/680,067

Applicant(s)

WAYNE J. SCHMIDT

Examiner

William T. Leader

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 40 and 56-75 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 40, 56-59, 64-69 and 75 is/are rejected.
- 7) ☒ Claim(s) 60-63 and 70-74 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/7/2005 has been entered.
2. Claims 41-55 have been canceled. Claim 40 has been amended. New claims 56-75 have been presented.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 40 and 56-75 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Independent claim 40 has been amended to recite that the electrical contacts have a portion inclined toward the processing plane. At page 7 of the Remarks, applicant indicates that support for the subject matter of claims 40 and 56-75 is found in the text on pages 49-52 and in figures 24-28. The references text and figures are directed to an embodiment in which electrode fingers 824 have a J-shape. A portion extends away from the head assembly, an

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adjacent portion forms a U-shaped turn, and a third portion extends back toward the head assembly. There appears to be no description in the specification of contacts with a portion inclined toward a processing plane as now claimed. Based on this lack of description, the scope of the subject matter recited in the claims appears to be broader than that disclosed in the specification. This broader subject matter is considered to constitute new matter.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 40, 56, 58, 59, 64-67, 69 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Schuster et al (5,000,827) or Bacon et al (4,466,864) combined with Thompson et al (5,168,887) and Ishida (5,447,615).

8. Both Schuster et al and Bacon et al disclose apparatus for electroplating onto semiconductor wafers. The plating apparatus of each reference includes a bowl and fluid cup within the bowl. An annular fluid flow region is formed between the cup and the bowl. Electroplating solution enters from the bottom and rises in the cup until it flows over the edge which forms a weir. An anode electrode is located in the cup. Cathodic potential is applied to the back side of the wafer by a single contact. The wafer is held above the cup so that electroplating solution contacts its surface. See figure 7 of Schuster et al and figure 3 of Bacon et al. While the wafers are shown as being supported above the cup, substantial details of the supporting mechanism is not provided.
9. The Thompson et al patent is directed to apparatus for processing single semiconductor wafers. As shown in figure 1, the apparatus includes a movable head assembly 12 having a rotor that rotates about an axis and a workpiece holder with movable fingers adapted to hold the wafer on the rotor. The head assembly is movable from one process base 70 to another, and lowers the wafer into the base to a processing position.
10. The Ishida et al patent is directed to a device for plating semiconductor wafers. The device includes a plurality of electrical contacts arranged to contact the peripheral region of the workpiece. As shown in figures 6a and 6b, the contacts are inclined toward the wafer which is located in a processing plane, and have a tip portion to engage the wafer.
11. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have utilized a head assembly like that shown by Thompson et al to support the wafers above the processing cups of Schuster et al or Bacon et al because wafer would have been easily lowered into and raised from contact

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with the electroplating solution and rotated to improve uniformity of treatment. It would additionally have been obvious to have provided a plurality of electrical contacts to the wafer as taught by Ishida et al because improved current distribution would have been obtained.

12. Claims 57 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Schuster et al (5,000,827) or Bacon et al (4,466,864) combined with Thompson et al (5,168,887) and Ishida (5,447,615) as applied to claim s 40, 56, 58, 59, 64-67, 69 and 75 above, and further in view of Yee et al (5,078,852).

13. Claims 57 and 68 recite that the contacts have a first portion extending away from the processing plane and a second portion projecting from the first portion and inclined toward the processing plane. The Yee et al patent is directed to apparatus for electroplating a substrate having the configuration of a wafer. The apparatus includes contacts with portions which extend away from and toward the processing plane. It would have been obvious at the time the invention was made to have utilized contacts having a configuration shown by Yee et al to contact wafers because current distribution would have been improved by the use of a plurality of contacts and contact mounting structure would have been located beyond the periphery of the wafer to allow the wafer to be easily provided and removed from the plating apparatus.

14. Claims 60-63 and 70-74 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record does not suggest providing a filter in the inner vessel or cup.


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15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Okabayashi patent discloses apparatus in which a wafer-shaped workpiece is placed on a workholder which provides cathodic current and rotates the workpiece. The Shibata et al patent is directed to a method of electroplating integrated circuit packages and discloses that when the workpieces are rotated, uniform and efficient plating operation is achieved.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


William Leader
April 26, 2005


ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700